Lat 41.05727 Lon -121.85602

United States Department Of Agriculture | Forest Service | Shasta-Trinity National Forests

Reply To: 3420 Date: August 9, 1991

Subject: Biological Evaluation of Declining Sugar Pine on Skunk Ridge, Shasta Lake RD (FPM Report N91-13)

To: Forest Supervisor, Shasta-Trinity NF

On July 9, 1991, Dave Schultz and Sheri Smith, entomologists, and I visited areas on Skunk Ridge, Shasta Lake RD, at the request of Ken Smith, District TMO. We were accompanied by Ken, Bill Rametes, District Silviculturist, and Nancy Hutchins, Wildlife Biologist. The area we visited was along the top of Skunk Ridge (T. 37 N., R. 1 E.). From aerial observations, the district had noted a large area where the sugar pine had very thin crowns and yellow foliage on both NFS managed lands and intermingled private lands. They were interested in evaluating the cause and determining if future actions might be needed and appropriate.

The stands we looked at had been partially harvested in the past. The residual stand is comprised of Douglas-fir, white fir, ponderosa pine, sugar pine, incense-cedar and black oak. Most areas have a dense understory of shrubs and hardwoods, such as bigleaf maple, dogwood, and mountain ash. White fir is becoming an increasingly significant component as the overstory is either harvested or dies. There is still a substantial component of large predominant sugar pines on many parts of the ridge. Viewed on the horizon, the crowns of the sugar pines are obviously thinning from a loss of needles.

The area we examined is within a proposed habitat conservation area for the northern spotted owl. At this time, management activities are limited, but the district is anticipating that some stand manipulation may be possible in the future. Those present recognized the need for management intervention to sustain suitable habitat in the area.

Examination of individual sugar pines did not detect frass, pitch tubes, boring dust, or any other evidence of bark beetles or wood boring insects. Several trees did have one or more bole cankers up to 25 feet above the ground. On some of the stems with multiple bole cankers, the cankers were beginning to coalesce and it was obvious the trees would be girdled in the near future. The cause of the cankers appeared to be blister rust, caused by Cronartium ribicola. Although blister rust is usually associated with regeneration size trees, we have been observing it recently in larger trees and higher in the crowns. In this area the fungus has been present for possibly 6 decades and it is not unlikely to begin seeing it cause injury to larger trees.

These cankers were not the cause of the loss of needles. The needles from lower limbs that could be observed and those on the ground were heavily infested by black pineleaf scale, Nuculaspis californica. This is a widespread armored

scale that attacks a range of hosts, including sugar pine, ponderosa pine, Jeffrey pine, and lodgepole pine. Normally it occurs at low levels of up to one scale per 2 inches of needle. On occasion it can become epidemic, with 20 to 30 scales per inch observed. This is normally a localized infestation associated with environmental conditions that disrupt the populations of the scale's natural enemies. Epidemics over large areas of several thousand acres have occurred in northern California in the past, although the reason for the population release is not known.

The black pineleaf scale is a sucking insect that removes sap from the needles. Sufficient numbers of scale will result in older needles yellowing and being cast, with only tufts of the current year's needles retained at the branch tips. Most of the older sugar pine on Skunk Ridge currently have only one or two years of needle retention throughout most of their crowns. The reduction in tree vigor caused by a black pineleaf scale infestation is compounded by other stress-causing agents such as drought and heavy vegetative competition. Following several years of defoliation, growth is reduced and trees become less thrifty and more susceptible to attack and mortality by bark beetles and wood borers.

No practical direct control method exists for reducing the effect of black pineleaf scale over large forested areas. Individual high value trees could be treated with insecticides either to reduce the scale population or to prevent bark beetle attacks. If the District had an identified rust resistant sugar pine in the area this might be feasible and realistic.

Higher levels of sugar pine mortality can be expected in trees that are being severely defoliated. In general, sugar pine across northern California are suffering higher levels of mortality because of the ongoing drought and the added stress of defoliation will only increase that rate. Although it appears the scale infestation has been increasing over the past several years, it is expected that the scale population will decline in another year or two as natural controlling agents respond.

Beyond the defoliation, the present condition of the vegetation in this area and the desired future state need to be analyzed. If the present condition continues unaltered, most of the large overstory trees will die leaving a mixed stand of white fir and hardwoods. Because many of these white fir have heavy dwarf mistletoe infections and have been suppressed for decades, they will not develop the size nor age of the more shade intolerant species suitable to this site. Some type of stocking control and species manipulation is required to maintain the species diversity and desirable size and stand structure.

If you have any questions about this evaluation or need additional assistance, especially with the development of a long-term vegetation management plan for the area, please contact us in the Shasta-Trinity SO (916-246-5101).

/s/

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